

PCT

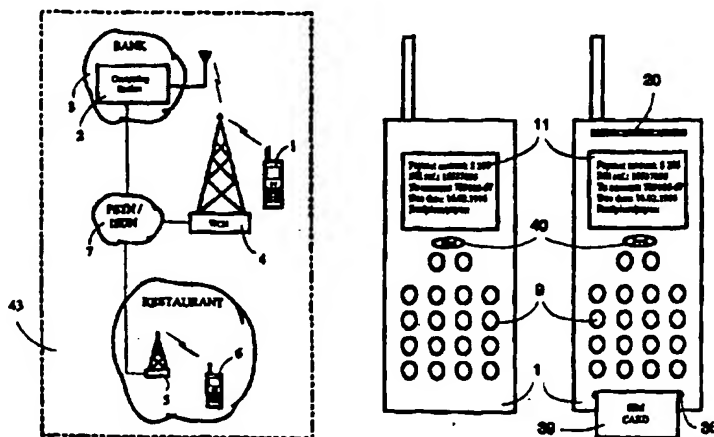
WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>G07F 7/08, 19/00, G06F 17/60 // 157:00</b>		A1	(11) International Publication Number: <b>WO 96/13814</b>
			(43) International Publication Date: <b>9 May 1996 (09.05.96)</b>
(21) International Application Number: <b>PCT/FI95/00591</b>		(81) Designated States: FI, JP, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
(22) International Filing Date: <b>25 October 1995 (25.10.95)</b>		<p><b>Published</b></p> <p><i>With international search report.</i></p> <p><i>With amended claims and statement.</i></p>	
(30) Priority Data: <b>945075 28 October 1994 (28.10.94) FI</b>			
(71)(72) Applicant and Inventor: <b>VAZVAN, Behruz [FI/FI]; Jämeräntaival 11 B 53, FIN-02150 Espoo (FI).</b>			

(54) Title: REAL TIME TELE-PAYMENT SYSTEM



(57) Abstract

This invention is a real time mobile tele-payment system that relates to payments of bills of mobile users, or providing the mobile users with the information about their bank account, the statement of account, or the movement on the account in a real time basis, by using their portable telephones under any wireless telecommunications systems. Certain features of this invention are intended as an expansion of value-added services of currently existing mobile communications systems. This invention also provides the retail and trading businessmen with the possibility to charge their customers, via wireless communications networks and in a real time basis, by using their mobile telephones. In this invention, in order to pay his/her bills, a mobile telephone subscriber enters the payment (bill) information and the payee's account number into the mobile payment part (10) which is included in his/her mobile telephone (1) or (6). After having dialled the telephone number of computing station (2) which is based in the bank (3), the payment information will be sent to the computing station (2) via a mobile communications network (4). In the computing station (2) the calling party's identity will be checked and then the payment will be transferred from the calling party's bank account to the payee's account and then both the calling party and the payee will be informed about the relevant payment. In this invention, the portable telephone is also equipped with a small charge slip printer which can print a receipt for customers of retail businesses.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CN	Cameroon	LK	Sri Lanka	SN	Senegal
CS	China	LU	Luxembourg	TD	Chad
CV	Cape Verde	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

## **Real Time Tele-payment System**

This invention is a mobile payment system that relates to payments of bills of the mobile users, or providing the mobile users with the information about their bank account balance, the statement of account, or the movement on the account in a real time basis, by using their portable telephones under any wireless telecommunications systems.

### **BACKGROUND OF THE INVENTION**

There are several mechanical and electronical payment systems for retail business operations like, for example, what is introduced by US patent US-A-5 202 825, in which a hand-held data terminal generates a record of purchases made by a customer for charging a customer in accordance with customer-indicated payment preferences. In these systems the waiter sends by use of a portable data terminal the customer's order to a customer service station which is a typical cash register based in the restaurant. These systems reduces the time requirements for processing customers at check-out counters in comparison with those of more traditional check-out procedures of the recent past. These systems are only for sending the customer order to the cash register in the retail business.

On the other hand in the fixed telecommunications networks a user (subscriber) can be connected from his personal computer to his/her bank via telephone lines and thereby pay his/her bills. In such systems user must use a data modem between his/her computer and the telephone wire. Another disadvantage of such systems is that in order to pay his/her bills, user must have access to a personal computer connected to the fixed telephone infrastructure, therefore user mobility in such systems is completely limited. Before this invention, there was no solution that provides the portable/mobile telephone users with the possibilities to pay their bills by using their personal portable telephones. There was also no payment system, based on use of portable or mobile telephones, that could provide the retail or trading businesses with the possibility to charge their customers in a real time basis; transferring the charges from the customer's account to the account of the retail businessman. There continues to exist a need to further improve the efficiencies of payment systems.

### **DESCRIPTION OF THE INVENTION**

In order to serve such current need, the present invention provides a new and unique mobile payment system. In the inventive system a portable telephone can be used in order to pay bills or transfer money from a bank account to other, or request the bank

for account information. Certain features of the invention are intended as an expansion of value-added services of currently existing mobile communications systems. This invention addresses needs created by users mobility. For example, suppose that you are travelling and you want to pay a certain bill or transfer some amount of money from your bank account to another person's account but you do not have time for going to the bank or the bank may be closed and you may neither have access to your personal computer (which can be connected to the bank via telephone wire). This invention provides you the possibility to pay your bills, by using your portable telephone while you are in move, regardless of are banks closed or not, regardless of if it is night or weekend etc. This invention also provides the retail businesses (for example restaurants) the possibility to charge their customers, via wireless telecommunications networks, by using only the portable telephones. For example, a waiter in a restaurant, after having entered the amount of payment and customer's information (like account number etc.) to his/her portable terminal can send the payment information to the inventive computing station, which is located in the bank. In the computing station the customer's bank account will be charged in accordance with the payment amount received from the waiter's portable telephone. The most important advantage gained by the inventive system is that all mobile telephone subscribers can pay their bills by using only their normal mobile telephones (in which the mobile payment part is included) and their subscriber identity or codes, without requiring any additional data modem, personal computer, and credit cards etc. In this invention the subscriber identity and codes function as the credit card or bank card of the portable terminal's user.

By implementing the inventive mobile payment system a mobile user (subscriber) can pay all his/her bills and handle all his/her banking issues by only using his/her mobile telephone and subscriber identity or codes, where ever under the coverage of a wireless communications network. These and other improvements and advantages are realised by providing a portable telephone (hereafter called portable terminal) including the inventive mobile payment part, and a computing station which is based in the bank. The present invention will now be described by way of examples with reference to the accompanying drawings, in which:

**Fig. 1** is a schematic representation of the inventive Real Time Tele-payment System.

**Fig. 2** represents, as an general example, a payment flow diagram between the portable terminal and the computing station, which is located in the bank.

**Fig. 3** represents, as an general example, a payment flow diagram in which a mobile user pays his/her bills or request the statement of his/her account by using his/her own

portable telephone. In this figure also the payee is informed about the reception of a payment.

**Fig. 4** is a schematic representation of two type of portable terminal: one is a normal portable telephone that includes the inventive mobile payment part, and the other is a portable telephone that includes the inventive mobile payment part, a charge slip printer and a user-friendly SIM card reader (SIM: Subscriber Identity Module).

When a mobile user wants to pay a bill or transfer money from an account to other, he/she enters all information required for payment (like his/her account number, the payee's account number, payment's due date, bill's reference number, etc.) to the mobile payment part of his/her portable terminal 1 (for example through the keypad). As it is the object of this invention, the user's own account information dose not need to be entered into the mobile payment part if the computing station 2, based in the bank 3, can identify the calling party. This needs that the user information (identity) should be confirmed by his/her telephone operator or service provider in a wireless communications network 4 and then be sent to the bank as a confirmation of user (subscriber) identification. More precisely, user identity can be sent by user's telephone operator or service provider to the computing station 2 when portable terminal 1 set-ups a call or a short message to the computing station 2. Monitoring a calling party's subscriber number or information at a receiving terminal is a feature provided by today's digital telephone systems. In this invention, in order to implement such procedure, for example the switching systems at the mobile network side can be used so that only when a user set-ups a call or sends a message (by using short message services of the mobile communications systems) to the computing station 2 his/her identity can be monitored in the computing station 2 in order to identify who is the calling party. Therefore, in this invention the computing station 2 receives at least the confirmed user identity from the user's telephone operator or service provider of a wireless communications network (WCN) 4 in order to identify who is in charge for payment of bills sent by portable terminal 1. Other required information like passwords or access codes to the user's bank account will be sent by user through his/her portable terminal 1. In today's mobile telecommunications systems the user identity, included in his/her SIM card, is checked and confirmed by network 4 every time his/her portable terminal 1 is turned on and attached to the telephone network 4. Since the user identity, transmitted from the portable terminal 1 to the network 4, is completely encrypted and secured therefore the payment messages between portable terminal 1 and computing station 2 are also quite secured because of: first, the security algorithms used in the today's digital wireless telecommunications systems and mobile telephones, and secondly, because of the user's password or access codes used for payment messages in the inventive mobile payment system. All kind of wireless

communications networks can be used in order to communicate the payment messages between the portable terminal and computing station. For example if in the restaurants there is a cordless network like DECT (Digital European Cordless Telephony) 5 then the portable terminal 6 can be connected through such network and PSTN (Public Switched Telephone Network) or ISDN (Integrated Services Digital Network) 7 to the computing station 2.

The payment question-answering procedure between the user and portable terminal 8 is entered by using the user interface 9 and received and handled by the inventive mobile payment part 10. The payment information entering procedure 11 is an interactive procedure between the mobile payment part 10 and the user through user interface 9. Then, the computing station's telephone number will be dialled 12 (either automatically or by user) which after the portable terminal 8 sends the required information for call set-up to the wireless communications network 15 and then payment messages 13 to the computing station 14 via the same network 15. If the portable terminal 8 does not send the user (telephone subscriber) identity to the computing station 14, then the wireless communications network 15 confirms and sends the user identity to the computing station 14 either directly or through the fixed public network 16. The computing station 14 checks the calling party's account and account number of payee (the account to which the payment should be transferred) and then transfers the required amount of payment from the payer's account to the account of payee 17. After that the payment has been completed the computing station 14 sends a message 18 to the portable terminal 8 indicating "payment completed" or if there is not enough credit (money) in the payer's account a "No effects" message 19 will be sent to the portable terminal 8, meaning that the payment can not be accepted. For retail businesses, portable terminal includes also a charge slip printer 20. If the portable terminal receives a "payment completed" command 18, the charge slip printer 20 prints a receipt for the customer. In this invention for the retail and trading businesses, the customer's SIM card 39 is entered in the SIM card reader 36 of the portable terminal 1 (of a waiter in a restaurant, for example) temporary in order to pay the bill. Then the portable terminal 8 will be connected to the wireless communications network 15. The account number of payee (for example account number of the restaurant) can be saved in the memory of his/her portable terminal in order to reduce the information entering procedure of the mobile payment part. This means that only the payment amount should be entered to the mobile payment part. After that the payment amount has been entered to the mobile payment part 10 and the computing station's 14 telephone number has been dialled 12, the wireless network 15 sends the customer's identity, which can be the subscriber identity or a different code,

to the computing station 14. The computing station 14 can identify the calling party (the payer) because it has received the calling party's identity from the wireless network 15 and compared with the calling party's identity based in the computing station 14. Therefore the calling party will be charged for the payment amount received from the portable terminal 8. The subscriber identity sent from the wireless network 15 to the computing station 14 can be different than the payer's identity sent by the portable terminal 8 to the wireless network 15 but both of these identities belong to one user (subscriber). Alternatively the payer's identity, included in his/her SIM card 39 or entered to the portable terminal by using user interface 9, can be sent directly from the portable terminal 8 to the computing station 14. It should be understood that for the simplicity of the description, messages for outgoing call set-up and incoming call or short message services procedures are not explained with details since these procedures are already well known in the mobile communications systems.

Following is an example, in which a mobile user pays his/her bills or transfers money from his/her bank account to other, or ask the bank for statement of account, by using his/her own portable telephone.

First, the payer enters the bill's information 22 (for example: account number of payee, the amount of money which should be transferred, due date of the bill, reference number 11) to the mobile payment part 21 of his/her portable terminal 41. Then, after activating an OK function by user, the mobile payment part dials 23 the telephone number of the computing station located in the bank 24, which after the mobile payment part 21 sends the payment information 25 to the computing station 24, via a wireless communications network (WCN) 26 and fixed network 27 (PSTN/ISDN). Then, computing station 24 transfers the amount of payment, mentioned on the bill, from the payer's account to the payee's account 28. Then, computing station 24 sends a "Payment Completed" message 29 to the portable terminal's mobile payment part 21. If the payee has also a portable terminal 37, then also his/her mobile payment part 42 would receive a "Payment Reception message" 30, from computing station 24, indicating the amount of payment, the payer and the payment date. However, before dialling the number of computing station, the mobile payment part may ask the payer (the user of portable terminal) "Any other payment ?" 31. The answer can be respond by activating "Yes/No" function 32 or OK function of the mobile payment part 21. Then the user can enter another bill information to the mobile payment part 21 and when all information required by mobile payment part has been provided, the telephone number of computing station 24 will be dialled 23. After this, all bills information (payment messages) will be sent to the computing

station in the bank 24 as explained above. Furthermore, there is a command 33 "Send the Statement of Account" in the mobile payment part 21 for requesting the account balance, the statement of account, or the movement on the account from the computing station 24. When a user selects such command 33, the mobile payment part 21 sends this message 33, either by setting up a call or by using the short message facilities of mobile communications networks 26 to the computing station 24. Then computing station 24 sends the required account balance or the statement of account 34 to the mobile payment part 21 of the portable terminal 41. The computing station 24 also sends a "Monthly Statement of Account" 35, to the portable terminals 41, 42 once or twice per month. Then portable terminal's printer 38 can print it for the user to be filed as a record, if required.

Following is an example in which the payee (for example a restaurant or a retail seller) has a portable terminal by which the payer's (a customer) account can be charged.

Suppose that a customer wants to pay his/her bill in a restaurant for the service he/she has received. The customer can give his/her SIM card 39 or credit card to the waiter to be entered to the waiter's portable telephone 1, 8. Then waiter dials the telephone number of computing station 14, or the number will be dialled automatically after the SIM card 39 or credit card has been read by the SIM card or credit card reader 36 of the waiter's portable terminal. For example the telephone number of computing station 14 can be saved in the memory of the portable terminal of waiter, and every time a customer's SIM or credit card 39 is entered to the portable terminal 1, the portable terminal automatically contact the computing station 14, after having registered in the network 15. In the bank, the computing station 14 checks the account information of payer (a customer) and then transfers the transaction amount (the sum on the bill) to the payee's (the restaurant) account 17. If the payer's account do not have enough credit (money) the portable terminal 8 may receive a "No effects" message 19, or the bank may pay the transaction's amount on behalf of the payer and then later charge the payer or his/her bank for the prepaid transaction. On the other hand if the payer's account information (account number, account identity) is false the computing station 14 may send a "transfer not accepted" message to the payee's portable terminal, which means that the payer (customer) should pay the amount of transaction in cash. If the portable terminal receives from the computing station 14 a "payment completed" message 18, then the charge slip printer 20 prints a receipt for the customer, as explained in the first example.



It should be considered that in all above-mentioned examples, payment messages can be sent and received either by setting up a call between the portable terminal and computing station or by using short message services facilities of the wireless communications networks.

In the current mobile communications systems, like GSM, there is a facility called "Short Message Services, (SMS)". In SMS a mobile telephone user can send short messages to another subscriber without setting up an interactive call. In order to send the payment messages by SMS, the software of SMS installed in the portable terminal can be modified so that it can also handle the payment parameters and/or commands of the inventive mobile payment part 10. Then by using the SMS services of the wireless communications network 15, the bill's information 13 can be sent to the computing station 14. When computing station 14 receives such payment message 13 sent by SMS, it also generates a message to be sent to the portable terminal in order to inform it if the payment has been completed 18 or not 19. However, if a user wants to pay many payments (bills) at once and receive also balance or statement of his/her bank account from the computing stations, such long message can be divided to smaller parts and then be combined at the portable terminal or computing station. This means that each bill information can be sent separately using the short message services. This action is transparent to the user of portable terminal. For example several payment information can be entered to the mobile payment part 10. Then when user selects the "Send" function 40 on the portable terminal 1, each bill will be sent by one short message in accordance of short messages length. For example, a short message may not include more than 100 letters. If a payment message or the statement of account (sent by computing station) needs more than the assumed 100 letters, then such long information will be divided into two or several short messages and then will be sent one by one to the portable terminal or computing station.

In this invention computing station can send and receive messages either via PSTN (Public Switched Telephone Network) and ISDN (Integrated Services Digital Network) and other fixed networks or via only a wireless communications network. The computing station includes all means for transmitting and receiving payment and banking messages via the wireless networks.

It is to be understood that various changes and modifications can be made to alter the specifically described structure or methods of operation of the preferred embodiment without departing from the spirit and scope of the invention. This invention is to be defined only by the scope of the claims appended hereto.

## Claims

1. A mobile payment system (43), characterised in that it is comprised of:

- at least one portable terminal (1, 6, 8), such terminal including a mobile payment part (10, 21) and other means for entering, transmitting, receiving and printing of information relating to: the payments of bills of the telephone subscriber or the user of said portable terminal; transferring of money from the bank account of the subscriber or user to the others account; sending and receiving payment messages (13, 18, 19, 25, 29) or messages including the account balance, the statement of account, or the movement on the bank account (33, 34, 35) of the telephone subscriber or the user of the portable terminal (41, 37);
- at least one computing station (2, 14, 24) which is located in the bank (3), said computing station including means for communicating with said portable terminal and for transferring the amount of payment (money) from the bank account of portable terminal's user and/or telephone subscriber to another bank account (17, 28), or from a customer's bank account, whose account information is entered into said portable terminal, to the calling party's account; and to receive and send messages about the account balance, the statement of account, or the movement on the bank account (33, 34, 35) of the portable terminal's subscriber or user;
- at least one wireless communications network (4, 15, 26) through which said portable terminal can send and receive to or from said computing station said payment messages or messages about the account balance, the statement of account, or the movement on the bank account of said portable terminal's subscriber or user.

2. A mobile payment system (43) according to claim 1, characterised in that said at least one portable terminal (1, 6) is a first plurality of portable terminals, and in which the number of said portable terminals in said first plurality of portable terminals is greater than said at least one computing station (2).

3. A mobile payment system (43) according to claim 1 and 2, characterised in that the payments or bills of a mobile telephone subscriber can be paid by entering the subscriber identity and codes into said portable terminal (1, 6, 8, 41) and the bill's information, including the payee's bank account number, the amount of payment, bill's due date and reference number into the mobile payment part (10, 21) of said portable terminal, and by setting up a call or a short message to the bank's computing station

(2, 14, 24) and sending the payment (bill's) messages (13, 25) to said computing station (2, 14, 24).

4. A mobile payment system (43) according to claim 1, 2 and 3, characterised in that said at least one portable terminal (1, 6) comprises all means for transmitting and receiving payment messages to or from said computing station (2); and that:

- said portable terminal includes a mobile payment part (10, 21) for handling the payment information (11, 22, 31, 32) entered by user to said portable terminal, and that said payment information can be saved into the memory of said portable terminal and be sent to said computing station, whenever required; and that:

- said portable terminal receives a message (18, 19, 29) from said computing station indicating that either the payment or transferring of the required amount of payment from the payer's to the payee's bank account has been accepted and/or completed or not.

5. A mobile payment system (43) according to claim 1, 2, 3 and 4 characterised in that the user of said portable terminal can enter more than one payment or bill information to the mobile payment part (10, 21) , and that after that telephone number of said computing station based in the bank (2, 14, 24) has been dialled (12, 23) either manually or automatically, all required payment information (13, 25) will be sent to said computing station; and that:

- said portable terminal can send payment (bill's) information (13, 25), handled in mobile payment part (10, 12), to the computing station (14, 24) and receive the required payment messages (18, 19, 29) from said computing station by setting up a call or using the Short Message Services (SMS) of the wireless communications network (4, 15, 26); and that

- said portable terminal's subscriber information can be sent from the user's telephone operating network (4, 15, 26) to the computing station (2, 14, 24); and that

- said portable terminal includes a charge slip printer (20, 38) that can print all payment information and the information received from said computing station for user of said portable terminal, and that,

- said mobile payment part (10, 21) can be included into any kind of digital or analogue portable telephone that is capable of operating in cellular communications systems.

6. A mobile payment system (43) according to claim 1 - 5, characterised in that said computing station (2, 14, 24) after receiving a payment message (13, 25) from said portable terminal (1, 6, 8, 41), checks and charges the payer's account (17, 28) in accordance with the payment amount received from said portable terminal and then sends a message (18, 19, 29) to said portable terminal (8, 41, 37) in order to indicate that payment has been accepted and/or completed or indicating that there is not enough credit in the payer's account; and that:

- said computing station (2, 14, 24) can receive or send payment messages (18, 19, 29, 30) or other banking messages (33, 34, 35) to said portable terminal (1, 6, 8, 41) via either fixed and wireless communications networks (4, 7, 15, 16, 26, 27) or via only wireless communications network (15, 26); and that,

- said computing station (2, 14, 24) can receive the payer's information and identity either from the payer's telephone operator or service provider through wireless communications network (4, 15, 26) when payer telephones or send messages (13, 25) to said computing station (2, 14, 24) or from the payer's portable terminal (1, 6, 8, 41); and that, the payer's information received from said payer's telephone operator or service provider or from said portable terminal may include payer's subscriber information or identity or any other required information; and that,

- said computing station can monitor the subscriber information or other identity, received from said payer's telephone operator or service provider or portable terminal, and based on said subscriber information or other identity and account number transfer the required amount of payment (money) from the payer's account to any other required account; and that,

- said subscriber information or identity will be confirmed by subscriber's telephone operator or service provider (4, 15, 26) and said confirmed information will be sent to said computing station (2, 14, 24) in which the subscriber identity will be checked (17, 28) and based on that, the received payment message (13, 25) can be accepted and a payment completed message (18, 29) will be sent to said portable terminal (1, 6, 8, 41); and that,

- said computing station (2, 14, 24) can send or receive payment messages (13, 18, 19, 25, 29, 30, 33, 34, 35) to or from the portable terminals (1, 6, 8, 41, 37) of both the payer and the payee; and that,

- said computing station (2, 14, 24) is equipped with all means for transmitting and receiving messages via any wireless communications network, to or from said portable terminal (1, 6, 8, 41, 37).

7. A mobile payment system (43) according to claim 1 - 6, characterised in that the mobile payment part (10, 21) may ask the user to enter all payment information

(11) such as payee's account number, bill's reference number, bill's due date, the amount of payment and other required information; and that:

- said mobile payment part (10, 21), after receiving all information about a payment or a bill from the user through user interface (9), may ask the user of said portable terminal "any other payment ?" (13) indicating dose user wants to pay another bill or payment; and that,

8. A mobile payment system (43) according to claim 1 - 7, characterised in that said portable terminal (1, 6, 8, 41) can be used in order to pay the bills of any mobile telephone subscriber by entering each subscriber's identities and codes into said portable terminal either by using the portable terminal's user interface (9) or the SIM card (39) and card reader (36); and that:

- said mobile telephone subscriber's codes can be different than said subscriber's identities; and that said subscriber codes can be included both in the subscriber's SIM card (39) and said computing station (2) located in the bank (3); and that:

- said portable terminal (1, 6) can be used in order to charge customers, in retail or trading businesses, by entering the customers' telephone SIM card (39) into said portable terminal (1, 6) and by using the telephone subscriber identities of each customer as an identification for payment; and that:

- after that said customer's SIM card (39) has been entered to said portable terminal (1, 6, 8), said portable terminal will be re-connected to the wireless communications network (4, 15) in order to check the subscriber identity, which after the customer's (subscriber's) bank account can be charged by sending payment messages (13) to the computing station (2, 14).

**AMENDED CLAIMS**

[received by the International Bureau on 25 March 1996 (25.03.96);  
original claims 1 and 3-8 amended; new claims 9 and 10 added;  
remaining claims unchanged (8 pages)]

1. A mobile payment system (43), utilizing the Short Message Services (SMS) facilities of mobile communication networks such as GSM (Global System for Mobile Communications), and subscriber identity such as SIM card (Subscriber Identity Module), and a new mobile-telephone-based functionality and mobile network architecture characterized in that it is comprised of:

- at least one portable terminal (1, 6, 8), such terminal utilizing the inventive Mobile Payment Part (10, 21), which provides a function and SMS-based adaptation and application part integrated into said portable terminal to provide at least an alphanumeric payment (bill) inquiry (e.g. 11), and including other means for entering, transmitting and receiving, and printing of the information mainly related to: the payments of bills of the telephone subscriber (1, 6, 8); transferring of money from the bank account of the subscriber or user to the others account; sending and receiving payment messages (13, 18, 19, 25, 29) or messages including the account balance, the statement of account, or the movement on the bank account (33, 34, 35) etc. of the telephone subscriber of the portable terminal (41, 37) without requiring to use any additional data modem to be used in conjunction with said portable terminal for transmission and reception of said payment etc. messages;

- at least one computing station (2, 14, 24) which is located in the bank (3), as it is the object of the architecture of the inventive payment system (43), said computing station includes all information about the portable telephone subscriber data which is connected to the subscriber's bank account in the same bank wherein computing station is located, and said computing station includes means for communicating with said portable terminal (4) and transferring the amount of payment (money) from the bank account of the payer (i.e. the calling subscriber) to another bank account (17, 28), and to receive and send messages about the payments, account balance, the statement of account, the movement on the bank account (33, 34, 35) or other banking messages etc. of the calling subscriber via SMS facilities of the wireless communication network (4);

- at least one wireless communication network (4, 15, 26) equipped with Short Message Services (SMS) infrastructure through which said portable terminal (1, 6, 8) can send and receive to or from said computing station said payment messages or other banking messages etc. and that said wireless communication network can confirm (i.e. authenticate) the subscriber identification for said computing station, whenever required or transfer the subscriber data received from said portable terminal directly to said computing station, in which the subscriber data can be compared with the subscriber data already recorded there.

2. A mobile payment system (43) according to claim 1, **characterized** in that said portable terminal (1, 6) is a first plurality of portable terminals, and in which the number of said portable terminals in said first plurality of portable terminals is greater than said at least one computing station (2).

3. A mobile payment system (43) according to claim 1, 2, **characterized** in that said portable terminal (1, 6, 41) comprises all means for transmitting and receiving payment etc. messages to or from said computing station (2) or other portable terminal (37); and that,

- said portable terminal includes the inventive Mobile Payment Part (10, 21) which is a short-message-based adaptation and application part for handling, dividing or connecting the payment etc. information (11, 22, 31, 32), and that said payment etc. information can be saved into the memory of said portable terminal and be sent to said computing station, whenever required; and that,

- after that portable terminal has been registered into the mobile network (4), the payments or bills of the mobile telephone subscriber (1, 6) can be paid by entering the bill's information such as the payee's bank account number, the amount of payment, bill's due date and reference number etc. into the Mobile Payment Part (10, 21), and by sending the short messages (e.g. 13, 33) to the bank's computing station (2, 14, 24) via SMS facilities of the mobile network (4) and receiving messages such as (18, 19, 30, 34, 35 etc.).

- said portable terminal receives a message (e.g. 18, 19, 29) from said computing station indicating that either the payment or transferring of the required amount of money from the payer's to the payee's bank account has been accepted and/or completed or not; and that,

- said portable terminal includes a charge slip printer (20, 38) that can print all payment information and the information received from said computing station for user of said portable terminal, whenever required.

4. A mobile payment system (43) according to claims 1, 2, 3, **characterized** in that the computing station (2, 14, 24) after receiving a payment message (13, 25) from said portable terminal (1, 6, 8, 41), checks and charges the subscriber's (payer's) account (17, 28) in accordance with the payment amount received from said portable terminal and then sends back a message (e.g. 18, 19, 29) including all information about the payment (e.g. bill reference, payer, amount etc.) to said portable terminal (8, 41, 37) in order to indicate that the payment has been accepted and/or completed or indicating that there is not enough credit in the payer's account; and that:

- said computing station (2, 14, 24) can receive or send payment messages (e.g. 18, 19, 29, 30) or other banking messages (e.g. 33, 34, 35) or any other message to said portable terminal (1, 6, 8, 41) via SMS of a mobile communication network (4, 5) through either fixed and wireless communication networks (4, 5, 7, 15, 16, 26, 27) or via only wireless communications network (4, 15, 26); and that.

- said computing station (2, 14, 24) can receive the payer's identity either from the payer's telephone operator system (4, 15, 26) when payer sends messages (e.g. 13, 25) to said computing station (2, 14, 24) or from the payer's portable terminal (1, 6, 8, 41); and that said payer's data received from said payer's telephone operator or from said portable terminal may include the payer's subscriber data or identity parameters or any other required information; and that.

- said subscriber data can be confirmed (i.e. authenticated) and secured either in the databases and infrastructure of the subscriber's telephone operator (4), or in said computing station, for example, by utilizing the algorithms used in mobile communication systems such as those of the GSM; and that.

- after that the subscriber data, communicated between said portable terminal and wireless communication network or directly between said portable terminal and computing station has been authenticated, the Mobile Payment Part (10) of the portable terminal or said computing station can send and/or receives payment etc. messages through SMS of a mobile communication network (4); and that.

- said computing station can monitor the subscriber identity, number etc., received alternatively from said payer's telephone operator or said portable terminal, and based on said subscriber identity and/or number and checking of his/her bank account number transfer the required amount of payment (money) from said payer's account to any other required account; and that,

- said subscriber data can alternatively be confirmed or sent by the subscriber's telephone operating network (4, 15, 26) to the computing station (2, 14, 24); as a confirmation of subscriber identification, enabling said computing station to compare the received subscriber data with the data already recorded in said computing station, and when subscriber data is compared and accepted by said computing station, the portable terminal can send payment messages to said computing station; and that,

- said subscriber data may include the subscriber telephone number, confirmed by mobile operator (4), or it may consist of the subscriber identity incorporated in SIM card, or any other code; and that.



- said computing station (2, 14, 24) can send or receive payment messages (e.g. 13, 18, 19, 25, 29, 30, 33, 34, 35) to or from the portable terminals (1, 6, 8, 41, 37) of both the payer and the payee; and that,

- said computing station (2, 14, 24) is equipped with all means for wired or wireless transmission and reception of messages communicated between said computing station (2), wireless communications network (4 or 5), and said portable terminal (1, 6, 8, 41, 37).

- said computing station may send e.g. a monthly report (e.g. 35) to said portable terminal (1, 6, 37, 41) to be displayed or printed (20, 38), for said subscriber, as a receipt and bank report for payments (bills, etc.) charged from the subscriber/payer account to the other subscriber/payee account, by said computing station.

5. A mobile payment system (43) according to any preceding claims, **characterized** in that the subscriber, for example, a waiter etc. in a restaurant can send the payment messages (e.g. a bill) by using the inventive portable terminal (1, 6, 8) either to the computing station (2, 14) or directly to the customer's portable terminal (e.g. a mobile telephone integrated with the inventive Mobile Payment Part), via SMS facilities of mobile communication network (5, 4), which after the payment can be accepted by said customer and be sent to the computing station (2) in which the payment procedure will be completed and then a message (including the bill's information) will be sent to both customer's and waiter's portable terminals indicating that either the payment has been completed and/or accepted (29, 30) or refused (19); and that:

- said waiter etc. or customer can enter the customer's identity code to said waiter's portable terminal, by using user interface (9), and then send the bill together with the customer's code to the computing station, which after said computing station generates a message and sends it to the customer's portable terminal to be accepted by the customer, and that after that the payment has been completed in the computing station, the computing station can send a message such as "Payment Reception" including all information about the payment (e.g. bill reference, payer, payment amount etc.) to the payee's terminal indicating that the payee has received the payment; and that,

- said portable terminal (1, 6) can be used in order to charge customers, in retail or trading businesses, by entering alternatively the customers' telephone SIM card (39) into said portable terminal's SIM card reader (36) and by using the telephone subscriber identity of each customer as an personal identification for payment; and that:

- after that said customer's SIM card (39) has been entered to said portable terminal (1, 6, 8), said portable terminal will be re-registered to the wireless communications

network (4, 15) and/or said computing station in order to check the subscriber identity, which after the customer's (subscriber's) bank account can be charged by sending payment messages (e.g. 13) to the computing station (2, 14).

6. A mobile payment system (43) according to any preceding claims, **characterized** in that whenever the subscriber turns on his/her portable terminal (1, 6) the Mobile Payment Part (10) sends the subscriber data, that can be included in the SIM card, to the computing station (2, 14) through an available wireless communication network (4, 5), and after that registration process between said computing station, said wireless communication network and said portable terminal (1, 6, 8) has been completed said portable terminal can have access to said wireless communication network through which it can send and/or receive payment, banking etc. messages to/from said computing station, and also be able to use the telecommunications services like voice etc. of said wireless communication network; and that,

- after said portable terminal has been registered in said wireless communication network (4) or computing station (2), the subscriber of said portable terminal can send and/or receive banking messages (e.g. 33, 34, 35) or can pay his/her bills by sending and receiving the payment etc. messages (e.g. 13, 18, 19, 25, 29) to the computing station (2, 14) or to another portable terminal, through the Mobile Payment Part (10) of his/her portable terminal; and that,

- said subscriber data can be a data which is recorded only in the SIM card and in said computing station that is located in the bank; and that,

- said subscriber data can be either similar to or different from that subscriber identity which is incorporated in the subscriber's telephone SIM card provided by mobile operators (4); and that,

- said subscriber data can be alternatively sent to said computer station after that registration of said portable terminal into said wireless communication network (4, 5,) has been completed, which after the subscriber can send and/or receive payment/bill messages to said computing station via SMS of said wireless communication network (4, 5,).

7. A portable terminal (1, 6, 8, 41, 37) according to any preceding claims, **characterized** in that it includes the inventive Mobile Payment Part (10, 21) which for each payment procedure may ask the subscriber (i.e. the payer) to enter all payment information (e.g. 11) such as payee's account number, bill's reference number, bill's due date, the

amount of payment and other information included in the bill or required for payment procedure; and that:

- said Mobile Payment Part (10, 21), after receiving all information about a payment or a bill from the user through user interface (9), may ask the subscriber of said portable terminal e.g. "Any other payment ?" (13) indicating dose subscriber wants to pay another bill or payment. and that after this message subscriber can enter other payment information into said Mobile Payment Part; and that,

- said portable terminal (1, 6, 8, 41) can be used in order to pay the bills of any mobile telephone subscriber by entering each subscriber's identities and codes into said portable terminal either by using the portable terminal's user interface (9) or by entering the SIM card (39) and card reader (36); and that:

- more than one payment or bill etc. data can be entered into said Mobile Payment Part (10, 21) of said portable terminal. and that after that telephone number of said computing station based in the bank (2, 14, 24) has been dialed (12, 23) either manually or automatically, all required payment information (e.g. 13, 25) will be sent to said computing station via SMS facilities of the mobile network (4, 5, 15, 26); and that,

- said portable terminal (1, 6, 8, 37, 41), includes all means of a mobile/cellular/cordless telephone for receiving and transmitting voice and data so that said portable terminal can function both as a mobile payment device and as a mobile/cellular/cordless telephone without requiring any data modem to be used in conjunction with the transmission and reception of payment etc. messages; and that,

- said Mobile Payment Part (10, 21) can be integrated into any kind of portable telephone that is capable of operating in cellular communications systems; and that,

8. A portable terminal (1, 6, 8, 41, 37) according to any preceding claims, **characterized** in that a small printing device (20, 38) is integrated into said portable terminal (1, 6, 37, 41) for printing any data received from computing station (2) or other portable terminals or any other source or the messages entered into said Mobile Payment Part (10, 11, 21) by its user or any other short messages received by said portable terminal.

9. A Mobile Payment Part (10) according to any preceding claims, **characterized** in that it is a component and function integrated into the portable terminal (1, 6), said Mobile Payment Part provides a payment (bill) inquiry (11) procedure including for example questions (such as payment amount, Bill reference, Receiver's account number, Due date, Recipient etc.) which can be displayed on the display (6) and which can be answered by the

user of the portable terminal through the user interface (9) and such payment information can be saved into the memory of the portable terminal or be sent to the computing station (2) or another portable terminal via SMS; and that

- said Mobile Payment Part (10) can be either integrated into said portable terminal as a component including the required soft-ware for providing said bill inquiry (e.g. 11), or said Mobile Payment Part can be integrated into the SIM card (i.e. Subscriber Identity Module) to provide said bill inquiry whenever subscriber wants to pay a bill or perform a payment; and that.

- said Mobile Payment Part is a function and SMS-based adaptation, integrated into said portable terminal or alternatively into said SIM card to provide an alphanumeric payment (bill) inquiry (11) procedure; and that.

- said Mobile Payment Part (10) can divide and split any long data of any length, for example e-mails done in a personal computer etc. which can be connected to said portable terminal into several short messages and send them to other portable terminals/telephones (e.g. 1 or 6) or to said computing station (2) via SMS facilities of a wireless communication network (e.g. 4 or 5) without requiring any data modem to be connected between the portable terminal and said personal computer, so that said Mobile Payment Part divides such e-mail to several short messages in a numbering sequence, for example, first short message, second short message etc.; and that.

- said Mobile Payment Part (10) is able to connect several short messages originated from a long data of any length e.g. an e-mail according to said short messages' numbers defined in the sender's portable terminal (e.g. 1) and their sender's identity (e.g. subscriber number), and put them into the original order and configure said original long data, which can be a long information sent by computing station or another portable terminal (e.g. 6) or any other source equipped with the inventive Mobile Payment Part (10) via SMS facilities of a mobile communication system (4), and then display said original data (e.g. the e-mail) on the display of the portable terminal (1, 6) or forward it to a separate monitor or personal computer without requiring any data modem to be used between said portable terminal and said personal computer; and that.

- all short messages which are resulted from a longer data and received by said portable terminal (1 or 6) or computing station (2) may contain a short message number which is unique for each message and is defined according to their dividing sequence; and that.

- all short messages which are divided from a longer data and received by said portable terminal (1 or 6) or computing station (2) , through SMS infrastructure (4 or 5).

may contain both the sender's and receiver's identity number (e.g. payer's and payee's subscriber numbers), which can be added to each short message either at said message sending portable terminal (e.g. 1) or at the wireless communication network's SMS facilities (4); and that.

- all short messages which are divided from a longer data and received by said portable terminal (1 or 6) or computing station (2), through SMS infrastructure (4 or 5), may be connected according to their sender's identity and their arrival time to the SMS facilities of a mobile communication system (4) or their sending time from the portable terminal or computing station or any other source; and that such sending or arrival time can be defined either at said portable terminal (e.g. 1), which sends the messages, or at the SMS facilities of the wireless communication network (4).

**10.** A mobile payment system (43) according to any preceding claims, **characterized** in that the telephone calls made by portable terminal (1, 6) can be charged simultaneously after each or several calls, from the subscriber's bank account (i.e. payer's account) to the wireless communication operator's (4 or 5) account, so that said operator can send the bills relevant to the telecommunications services used by said subscriber, directly to said computing station (2); and that,

- said computing station can include either the subscribers' data and bank account information or both the subscribers' and said wireless communication operator's data and bank account information so that the subscribers' all telephone calls can be charged directly from the subscriber's account to said wireless communication operator's bank account, by said computing station; and that.

- said computing station may send e.g. a monthly report (e.g. 35) to said portable terminal (1, 6, 37, 41) to be displayed or printed (20, 38), for said subscriber, as a receipt against charged calls or any telecommunications services used by said subscriber and charged from said subscriber bank account to the wireless communication operator's (4 or 5) bank account, by said computing station.

**STATEMENT UNDER ARTICLE 19**

Hereby we would like to file and publish the attached Amendment together with the above application. The claims filed are amended in order to better define the scope of the claims for the purposes of provisional protection. All claims are amended after that International Searching Report was received by the applicant so that the amended claims define the scope of the claims mainly based on using the second alternative (i.e. Short Message Services facilities, see page 7 of description). Moreover, it was noticed that the filed claims could not cover all objects of the above-mentioned application without applying for amendment. All claims amended here fall into the description of the invention, and go not beyond the disclosure in the above international application as filed. The differences between the claims as filed and as amended are indicated in the next page.

FIG 2

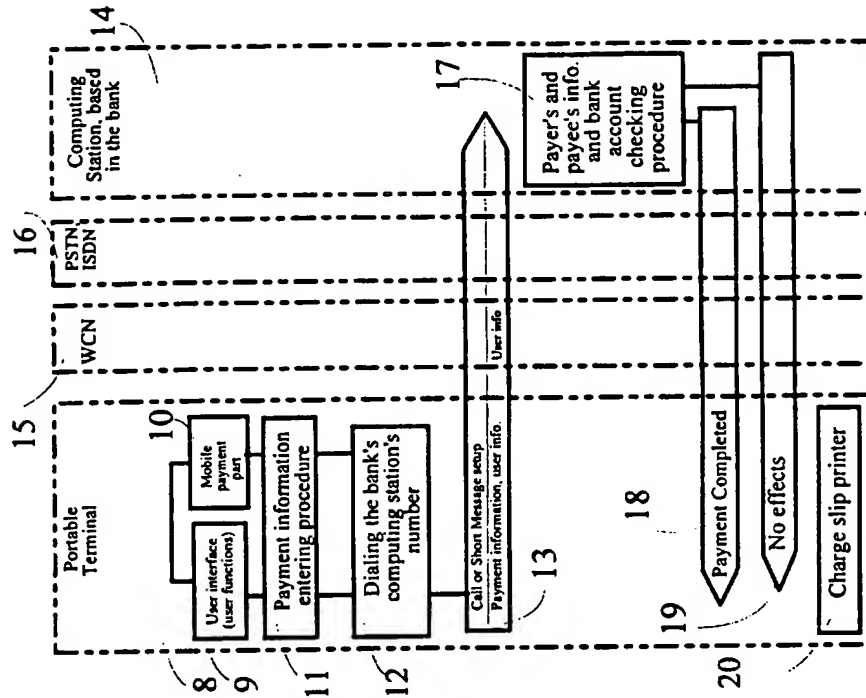


FIG 1

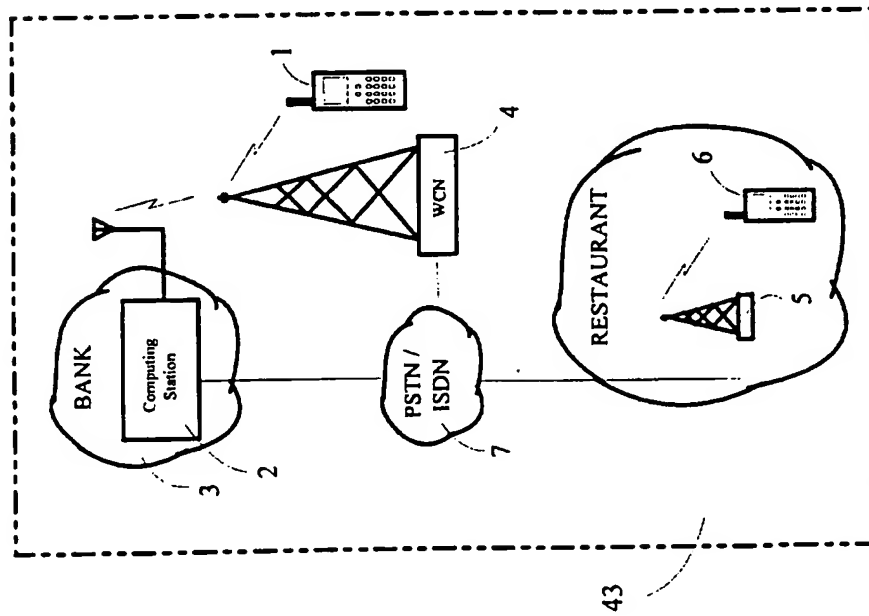


FIG 4

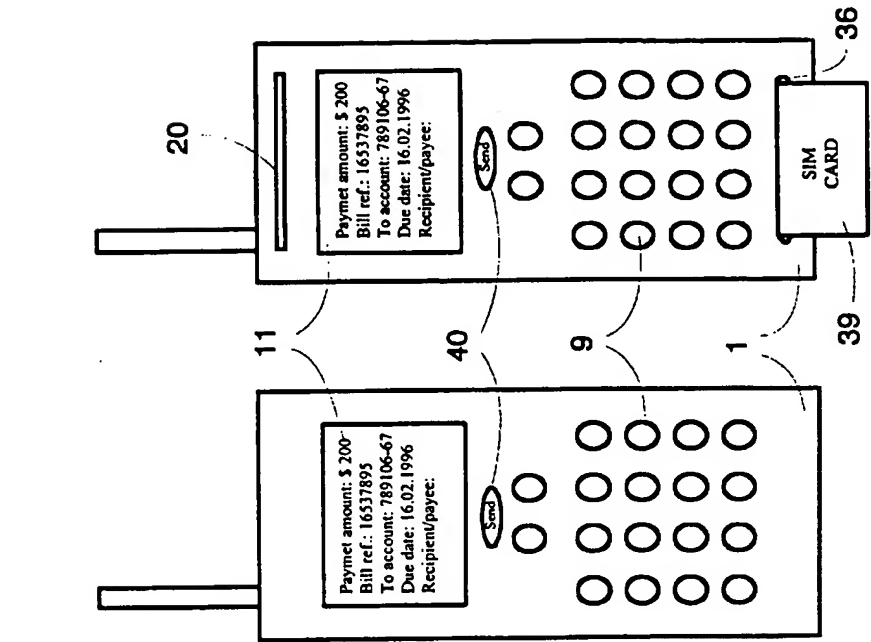
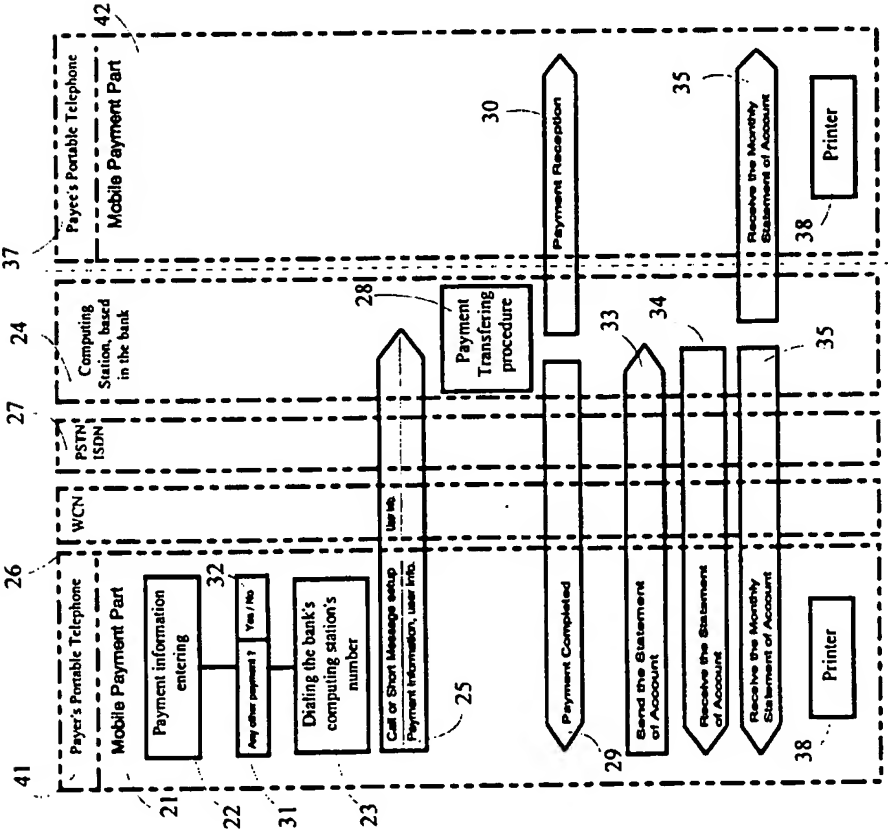


FIG 3





## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 95/00591

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G07F 7/08, G07F 19/00, G06F 17/60 // G06F 157:00  
 According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: G07F, H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9411849 A1 (VATANEN, H.T.), 26 May 1994 (26.05.94)  -----	1-8

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

1 March 1996

Date of mailing of the international search report

04-03-1996

Name and mailing address of the ISA/  
 Swedish Patent Office  
 Box 5055, S-102 42 STOCKHOLM  
 Facsimile No. +46 8 666 02 86

Authorized officer

Jan Silfverling  
 Telephone No. +46 8 782 25 00

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

05/02/96

International application No.

PCT/FI 95/00591

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO-A1- 9411849	26/05/94	NONE	